335-3-19-.01 ~~Reserved~~ Definitions. For the purposes of this Chapter and rules 335-3-10-.02(75) and 335-3-10-.02(76) only, the following words and phrases, unless a different meaning is plainly required by the content, shall have the following meanings.

(a) "Active collection system" means a gas collection system that uses gas mover equipment.

(b) "Active landfill" means a landfill in which solid waste is being placed or a landfill that is planned to accept waste in the future.

(c) "Closed area" means a separately lined area of an MSW landfill in which solid waste is no longer being placed. If additional solid waste is placed in that area of the landfill, that landfill area is no longer closed. The area shall be separately lined to ensure that the landfill gas does not migrate between open and closed areas.

(d) "Closed landfill" means a landfill in which solid waste is no longer being placed, and in which no additional solid wastes will be placed without first filing a notification of modification as prescribed under § 60.7(a)(4), 40 CFR. Once a notification of modification has been filed, and additional solid waste is placed in the landfill, the landfill is no longer closed.

(e) "Closed landfill subcategory" means a closed landfill that has submitted a closure report as specified in rule 335-3-19-.03(6)(e) on or before September 27, 2017.

(f) "Closure" means that point in time when a landfill becomes a closed landfill.

(g) "Commercial solid waste" means all types of solid waste generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities, excluding residential and industrial wastes.

(h) "Controlled landfill" means any landfill at which collection and control systems are required under this Chapter as a result of the nonmethane organic compounds emission rate. The landfill is considered controlled at the time a collection and control system design plan is submitted in compliance with rule 335-3-19-.03(1)(d)2.(i).

(i) "Corrective action analysis" means a description of all reasonable interim and long-term measures, if any, that are available, and an explanation of why the selected corrective action(s) is/are the best alternative(s), including, but not limited to, considerations of cost effectiveness, technical feasibility, safety, and secondary impacts.

(j) "Design capacity" means the maximum amount of solid waste a landfill can accept, as indicated in terms of volume or mass in the most recent permit issued by the Department, plus any in-place waste not accounted for in the most recent permit. If the owner or operator chooses to convert the design capacity from volume to mass or from mass to volume to demonstrate its design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, the calculation must include a site-specific density, which must be recalculated annually.

(k) “Disposal facility” means all contiguous land and structures, other appurtenances, and improvements on the land used for the disposal of solid waste.

(l) "Emission rate cutoff" means the threshold annual emission rate to which a landfill compares its estimated emission rate to determine if control under the regulation is required.

(m) "Enclosed combustor" means an enclosed firebox which maintains a relatively constant limited peak temperature generally using a limited supply of combustion air. An enclosed flare is considered an enclosed combustor.

(n) "Flare" means an open combustor without enclosure or shroud.

(o) "Gas mover equipment" means the equipment (i.e., fan, blower, compressor) used to transport landfill gas through the header system.

(p) “Gust” means the highest instantaneous wind speed that occurs over a 3-second running average.

(q) "Household waste" means any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including, but not limited to, single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas). Household waste does not include fully segregated yard waste. Segregated yard waste means vegetative matter resulting exclusively from the cutting of grass, the pruning and/or removal of bushes, shrubs, and trees, the weeding of gardens, and other landscaping maintenance activities. Household waste does not include construction, renovation, or demolition wastes, even if originating from a household.

(r) "Industrial solid waste" means solid waste generated by manufacturing or industrial processes that is not a hazardous waste regulated under Subtitle C of the Resource Conservation and Recovery Act. Such waste may include, but is not limited to, waste resulting from the following manufacturing processes: electric power generation; fertilizer/agricultural chemicals; food and related products/by-products; inorganic chemicals; iron and steel manufacturing; leather and leather products; nonferrous metals manufacturing/foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and miscellaneous plastic products; stone, glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment. This term does not include fly ash waste, bottom ash waste, boiler slag waste, or flue gas emission control waste which result from the combustion of coal or other fossil fuels at electric or steam generating plants. Additionally, this term does not include mining waste or oil and gas wastes, or small quantity generator waste as defined in ADEM Admin. Code r. 335-14-2-.01(5). Uncontaminated concrete, soil, brick, rock, and similar materials are excluded from this definition.

(s) "Interior Well" means any well or similar collection component located inside the perimeter of the landfill waste. A perimeter well located outside the landfilled waste is not an interior well.

(t) "Landfill" means an area of land or an excavation in which wastes are placed for permanent disposal, and that is not a land application unit, surface impoundment, injection well, or waste pile as those terms are defined under ADEM Admin. Code r. 335-13-1-.03.

(u) "Lateral expansion" means a horizontal expansion of the waste boundaries of an existing MSW landfill. A lateral expansion is not a modification unless it results in an increase in the design capacity of the landfill.

(v) “Leachate recirculation” means the practice of taking the leachate collected from the landfill and reapplying it to the landfill by any of one of a variety of methods, including pre-wetting of the waste, direct discharge into the working face, spraying, infiltration ponds, vertical injection wells, horizontal gravity distribution systems, and pressure distribution systems.

(w) "Modification" means an increase in the permitted volume design capacity of the landfill by either lateral or vertical expansion based on its design capacity as of July 17, 2014. Modification does not occur until the owner or operator commences construction on the lateral or vertical expansion.

(x) "Municipal solid waste landfill" or "MSW landfill" means an entire disposal facility in a contiguous geographic space where household waste is placed in or on land. An MSW landfill may also receive other types of RCRA Subtitle D wastes (ADEM Admin. Code r. 335-13-1-.03) such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste, and

industrial solid waste. Portions of an MSW landfill may be separated by access roads. An MSW landfill may be publicly or privately owned. An MSW landfill may be a new MSW landfill, an existing MSW landfill, or a lateral expansion.

(y) "Municipal solid waste landfill emissions" or "MSW landfill emissions" means gas generated by the decomposition of organic waste deposited in an MSW landfill or derived from the evolution of organic compounds in the waste.

(z) "NMOC" means nonmethane organic compounds, as measured according to the provisions of rule 335-3-19-.03(3).

(aa) "Nondegradable waste" means any waste that does not decompose through chemical breakdown or microbiological activity. Examples are, but are not limited to, concrete, municipal waste combustor ash, and metals.

(bb) "Passive collection system" means a gas collection system that solely uses positive pressure within the landfill to move the gas rather than using gas mover equipment.

(cc) “Root cause analysis” means an assessment conducted through a process of investigation to determine the primary cause, and any other contributing causes, of positive pressure at a wellhead.

(dd) "Sludge" means any nonhazardous solid, semisolid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility, exclusive of the treated effluent from a wastewater treatment plant.

(ee) "Solid waste" means any garbage or rubbish, construction/demolition debris, ash, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities or materials intended for or capable of recycling, but which have not been diverted or removed from the solid waste stream. The term "solid waste" does not include recovered material, solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to National Pollutant Discharge permits under the Federal Water Pollution Control Act 33 U.S.C. 1342, as amended, or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.). Also excluded from this definition are wastes from silvicultural operations, land application of crop residues, animal residues, animal manure and ash resulting exclusively from the combustion of fossil fuels or wood during normal agricultural operations or mining refuse as defined and regulated pursuant to the Alabama Mining Act.

(ff) "Sufficient density" means any number, spacing, and combination of collection system components, including vertical wells, horizontal collectors,

and surface collectors, necessary to maintain emission and migration control as determined by measures of performance set forth in this Chapter.

(gg) "Sufficient extraction rate" means a rate sufficient to maintain a negative pressure at all wellheads in the collection system without causing air infiltration, including any wellheads connected to the system as a result of expansion or excess surface emissions, for the life of the blower.

(hh) "Treated landfill gas" means landfill gas processed in a treatment system as defined in this rule.

(i) "Treatment system" means a system that filters, de-waters, and compresses landfill gas for sale or beneficial use.

(jj) "Untreated landfill gas" means any landfill gas that is not treated landfill gas.

Author: Ronald W. Gore
Statutory Authority: Code of Alabama 1975, §§22-28-14, 22-22A-5, 22-22A-6, 22-22A-8.
History: Effective Date: Proposed: July 20, 2021.

335-3-19-.02 ~~Reserved~~ General Provisions.

(1) The provisions of this Chapter apply to each existing MSW landfill for which construction, reconstruction or modification was commenced on or before July 17, 2014. Physical or operational changes made to an existing MSW landfill solely to comply with this Chapter are not considered a modification or reconstruction and would not subject an existing MSW landfill to the requirements of Subpart XXX as incorporated by reference in rule 335-3-10-.02(76), [see §60.760 of Subpart XXX, 40 CFR].

(a) The requirements of this rule shall become effective upon final approval by EPA.

(2) Collection and control of MSW landfill emissions shall be required at each MSW landfill meeting the following four conditions:

(a) The landfill has accepted municipal solid waste at any time since November 8, 1987, or has additional design capacity available for future waste deposition.

(b) The landfill has a design capacity greater than or equal to 2.5 million megagrams by mass and 2.5 million cubic meters by volume. The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. Any density conversions shall be documented and submitted with the design capacity report; and

(c) The landfill has a nonmethane organic compound emission rate greater than or equal to 34 megagrams per year or Tier 4 surface emissions monitoring shows a surface emission concentration of 500 parts per million methane or greater.

(d) The landfill in the closed landfill subcategory and has an NMOC emission rate greater than or equal to 50 megagrams per year or Tier 4 surface emissions monitoring shows a surface emission concentration of 500 parts per million methane or greater.

(3) For purposes of obtaining an operating permit under Chapter 335-3-16 of this Division, the owner or operator of a MSW landfill subject to this Chapter with a design capacity less than 2.5 million megagrams or 2.5 million cubic meters is not subject to the requirement to obtain an operating permit for the landfill under Chapter 335-3-16, unless the landfill is otherwise subject to Chapter 335-3-16. For purposes of submitting a timely application for an operating permit, the owner or operator of a MSW landfill subject to this Chapter with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters on the effective date of EPA's approval of the state's program [December 7, 1998], and not otherwise subject to Chapter 335-3-16, becomes subject to the requirements of Chapter 335-3-16, 90 days after the effective date [March 7, 1999] of said program approval, even if the design capacity report is submitted earlier.

(4) When a MSW landfill subject to this Chapter is closed as defined in this rule, the owner or operator is no longer subject to the requirement to maintain an operating permit under Chapter 335-3-16 for the landfill if the landfill is not otherwise subject to the requirements of Chapter 335-3-16 and if either of the following conditions are met.

(a) The landfill was never subject to the requirement to install and operate a gas collection and control system under rule 335-3-19-.03; or

(b) The owner or operator meets the condition for control system removal specified in rule 335-3-19-.03(1)(e).

(5) When an MSW landfill subject to this rule is in the closed landfill subcategory, the owner or operator is not subject to the following reports of this rule, provided the owner or operator submitted these reports under the provisions of Subpart WWW as incorporated by reference in rule 335-3-10-.02(75); or under the provisions of this rule on or before July 17, 2014;

(a) Initial design capacity report specified in subparagraph 335-3-19-.03(6)(a) of this rule.

(b) Initial or subsequent NMOC emission rate report specified in subparagraph 335-3-19-.03(6)(b) of this rule, provided that the most recent NMOC emission rate report indicated the NMOC emissions were below 50 Mg/yr.

(c) Collection and control system design plan specified in subparagraph 335-3-19-.03(6)(c) of this rule.

(d) Closure report specified in subparagraph 335-3-19-.03(6)(e) of this rule.

(e) Equipment removal report specified in subparagraph 335-3-19-.03(6)(f) of this rule.

(f) Initial annual report specified in subparagraph 335-3-19-.03(6)(g) of this rule.

(g) initial performance test report in subparagraph 335-3-19-.03(6)(h) of this rule.

Author: Ronald W. Gore
Statutory Authority: Code of Alabama 1975, §§22-28-14, 22-22A-5, 22-22A-6, 22-22A-8.
History: Effective Date: Proposed: July 20, 2021.

335-3-19-.03 ~~Reserved~~ Standards for Existing Municipal Solid Waste Landfills.

(1) Standards for Air Emissions from Existing Municipal Solid Waste Landfills.

(a) *Collection system.* Each MSW landfill meeting the conditions in 335-3-19-.02(2) shall install a gas collection as specified in subparagraphs (a)1. through (a)3. of this paragraph.

1. *Collection system.* Install and start up a collection and control system that captures the gas generated within the landfill within 30 months after:

(i) The first annual report in which the NMOC emission rate equals or exceeds 34 megagrams per year, unless Tier 2 or Tier 3 sampling demonstrates that the NMOC emission rate is less than 34 megagrams per year, as specified in subparagraph (6)(c)4. of this rule; or

(ii) The first annual NMOC emission rate report for a landfill in the closed landfill subcategory in which the NMOC emission rate equals or exceeds 50 megagrams per year, unless Tier 2 or Tier 3 sampling demonstrates that the NMOC emission rate is less than 50 megagrams per year, as specified in subparagraph (6)(c)4. of this rule; or

(iii) The most recent NMOC emission rate report in which the NMOC emission rate equals or exceeds 34 megagrams per year based on Tier 2, if the Tier 4 surface emissions monitoring shows a surface methane emission concentration of 500 parts per million methane or greater as specified in subparagraph (6)(c)4.(iii) of this rule.

2. *Active.* An active collection system shall:

(i) Be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control system equipment.

(ii) Collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of 5 years or more if active; or 2 years or more if closed or at final grade.

(iii) Collect gas at a sufficient extraction rate.

(iv) Be designed to minimize off-site migration of subsurface gas.

3. *Passive.* A passive collection system shall:

(i) Comply with the provisions specified in subparagraphs (1)(a)2.(i), (ii), and (iv) of this paragraph.

(ii) Be installed with liners on the bottom and all sides in all areas in which gas is to be collected. The liners shall be installed as required under 40 CFR § 258.40.

(b) *Control system.* Each MSW landfill meeting the conditions in rule 335-3-19-.02(2) shall control gas collected from within the landfill through the use of control devices meeting the following requirements, except as provided in 40 CFR § 60.24.

1. A non-enclosed flare designed and operated in accordance with the parameters established in 40 CFR § 60.18 except as noted in subparagraph (5)(d) of this rule; or

2. A control system designed and operated to reduce NMOC by 98 weight percent; or when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen or less. The reduction efficiency or concentration in parts per million by volume shall be established by an initial performance test to be completed no later than 180 days after the initial startup of the approved control system using the test methods specified in subparagraph (3)(d) of this rule. The performance test is not required for boilers and process heaters with design heat input capacities equal to or greater than 44 megawatts that burn landfill gas for compliance with this Chapter.

(i) If a boiler or process heater is used as the control device, the landfill gas stream shall be introduced into the flame zone.

(ii) The control device shall be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in paragraph (5) of this rule.

(iii) For the closed landfill subcategory, the initial or most recent performance test conducted to comply with 40 CFR 60 Subpart WWW of this; or any other requirement of this Chapter on or before July 17, 2014 is sufficient for compliance with this Chapter.

3. Route the collected gas to a treatment system that processes the collected gas for subsequent sale or beneficial use such as fuel for combustion, production of vehicle fuel, production of high-Btu gas for pipeline injection, or use as a raw material in a chemical manufacturing process. Venting of treated landfill gas to the ambient air is not allowed. If the treated landfill gas cannot be routed for subsequent sale or beneficial use, then the treated landfill gas shall be controlled according to either subparagraph (b)1. or 2. of this paragraph.

4. All emissions from any atmospheric vent from the gas treatment system are subject to the requirements of subparagraph (a) or (b) of this paragraph. For purposes of this Chapter, atmospheric vents located on the condensate storage tank are not part of the treatment system and are exempt from the requirements of subparagraph (a) or (b) of this paragraph.

(c) *Design capacity.* Each owner or operator of an MSW landfill having a design capacity less than 2.5 million megagrams by mass or 2.5 million cubic meters by volume shall submit an initial design capacity report to the Director as provided in subparagraph (6)(a) of this rule. The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. Any density conversions shall be documented and submitted with the report. Submittal of the initial design capacity report shall fulfill the requirements of this rule except as provided for in subparagraphs (a)1. and (a)2. below.

1. The owner or operator shall submit to the Director an amended design capacity report, as provided for in subparagraph (6)(a)3. [Guidance: Note that if the design capacity increase is the result of a modification, as defined in rule 335-3-19-.01, that was commenced after July 17, 2014, the landfill will become subject to Rule 335-3-10-.02(76), 40 CFR 60, Subpart XXX. If the design capacity increase is the result of a change in operating practices, density, or some other change that is not a modification as the defined in rule 335-3-19-.01, the landfill remains subject to this Chapter.]

2. When an increase in the maximum design capacity of a landfill with an initial design capacity less than 2.5 million megagrams or 2.5 million cubic meters results in a revised maximum design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, the owner or operator shall comply with the provision of subparagraph (d) below.

(d) Each owner or operator of an MSW landfill having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, shall either install a collection and control system as provided in subparagraphs (a) and (b) of this paragraph comply with subparagraph (d)2. of this paragraph or calculate an NMOC emission rate for the landfill using the procedures specified in paragraph (3) of this rule. The NMOC emission rate shall be recalculated annually, except as provided in subparagraph(6)(b)3. of this rule. The owner or operator of an MSW landfill subject to this Chapter with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters is subject to major source operating permitting requirements in Chapter 335-3-16.

1. If the calculated NMOC emission rate is less than 34 megagrams per year, the owner or operator shall:

(i) submit an annual NMOC emission report to the Director, except as provided for in subparagraph(6)(b)3. of this rule; and

(ii) recalculate the NMOC emission rate annually using the procedures specified in subparagraph (3)(a) of this rule until such time as the calculated NMOC emission rate is equal to or greater than 34 megagrams per year, or the landfill is closed.

(I) If the NMOC emission rate, upon initial calculation or annual recalculation required in subparagraph (d)1.(ii) above, is equal to or greater than 34 megagrams per year, the owner or operator shall install a collection and control system in compliance with subparagraph (b)2. below; calculate NMOC emission using the next higher tier in subparagraph (3) of this rule; or conduct a surface emission monitoring demonstration using the procedures specified in subparagraph (3)(a)6. of this rule.

(II) If the landfill is permanently closed, a closure report shall be submitted to the Director as provided for in subparagraph (6)(e) of this rule, except for exemption allowed under 335-3-19-.02(5)(d).

(III) For the closed landfill subcategory, if the most recently calculated NMOC emission rate is equal to or greater than 50 megagrams per year, the owner or operator shall either: Submit a gas collection and control system design plan as specified in subparagraph (6)(c) of this rule, except for exemptions allowed under rule 335-3-19-.02(5)(c), and install a collection and control system as provided in subparagraphs (a) and (b) of this paragraph; calculate NMOC emissions using the next higher tier in paragraph (3) of this rule; or conduct a surface emission monitoring demonstration using the procedures specified in subparagraph (3)(a)6. of this rule.

2. If the calculated NMOC emission rate is equal to or greater than 34 megagrams per year using Tier 1, 2, or 3 procedures, the owner or operator shall either:

(i) submit a collection and control system design plan prepared by a professional engineer to the Director within 1 year as specified in subparagraph (6)(c) of this rule, except for exemptions allowed under rule 335-3-19-.02(5)(c);

(ii) calculate NMOC emissions using a higher tier in paragraph (3) of this rule; or

(iii) conduct a surface emission monitoring demonstration using the procedures specified in subparagraph (3)(a)6. of this rule.

3. For the closed landfill subcategory, if the calculated NMOC emission rate is equal to or greater than 50 megagrams per year using Tier 1, 2, or 3 procedures, the owner or operator shall either:

(i) Submit a collection and control system design plan as specified in subparagraph (6)(c) of this rule, except for exemptions allowed under rule 335-3-19-.02(5)(c);

(ii) calculate NMOC emissions using a higher tier in paragraph (3) of this rule; or

(iii) conduct a surface emission monitoring demonstration using the procedures specified in subparagraph (3)(a)6. of this rule.

(e) *Removal criteria.* The collection and control system may be capped, removed, or decommissioned provided that the following criteria are met:

1. The landfill is a closed landfill as defined in rule 335-3-19-.01(d). A closure report shall be submitted to the Director as provided in subparagraph (6)(e) of this rule;

2. The collection and control system shall have been in operation a minimum of 15 years or the landfill owner or operator demonstrates that the GCCS will be unable to operate for 15 years due to declining gas flow.

3. Following the procedures specified in subparagraph (3)(b) of this rule, the calculated NMOC gas produced by the landfill shall be less than 34 megagrams per year on three successive test dates. The test dates shall be no less than 90 days apart, and no more than 180 days apart.

4. For the closed landfill subcategory (as defined in rule 335-3-19-.01(e)), following the procedures specified in subparagraph (3)(b) of this rule, the calculated NMOC emission rate at the landfill is less than 50 megagrams per year on three successive test dates. The test dates shall be no less than 90 days apart, and no more than 180 days apart.

(2) Operational Standards for Collection and Control Systems. For a MSW landfill with a gas collection and control system used to comply with subparagraphs (1)(a) and (b) of this rule, the owner or operator of an MSW landfill shall operate the gas collection and control system in accordance with the operational standards in this paragraph (as well as the provisions in paragraphs (4) and (5) of this rule, or the operational standards in 40 CFR § 63.1958, as incorporated by reference under ADEM Admin. Code r. 335-3-11-.06(78) (as well as the provisions in 40 CFR §§ 63.1960 and 63.1961, as incorporated by reference under ADEM Admin. Code r. 335-3-11-.06(78)), or both as alternative means of compliance. Once the owner or operator begins to comply with the provisions of 40 CFR §63.1958, as incorporated by reference under ADEM Admin. Code r. 335-3-11-.06(78), the owner or operator shall continue to operate the collection and control device according to those provisions and cannot return to the provisions of this paragraph. Each owner or operator of an MSW landfill with a gas collection and control system used to comply with the provisions of subparagraph (1)(a) and (b) of this rule shall:

(a) Operate the collection system such that gas is collected from each area, cell, or group of cells in the MSW landfill in which solid waste has been in place for:

1. 5 years or more if active; or

2. 2 years or more if closed or at final grade;

(b) Operate the collection system with negative pressure at each wellhead except under the following conditions:

1. a fire or increased well temperature. The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire. These

records shall be submitted with the annual reports as provided in subparagraph (6)(g) of this rule;

2. use of a geomembrane or synthetic cover. The owner or operator shall develop acceptable pressure limits in the design plan;

3. a decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes shall be approved by the Director as specified in subparagraph 335-3-19-.03(6)(c) of this rule;

(c) Operate each interior wellhead in the collection system with a landfill gas temperature less than 55°C (131°F). The owner or operator may establish a higher operating temperature value at a particular well. A higher operating value demonstration shall be submitted to the Director for approval and shall include supporting data demonstrating that the elevated parameter neither causes fires nor significantly inhibits anaerobic decomposition by killing methanogens. The demonstration shall satisfy both criteria in order to be approved (i.e., neither causing fires nor killing methanogens is acceptable).

(d) Operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator shall conduct surface using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in subparagraph (4)(d) of this rule. The owner or operator shall conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at no more than 30 meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover and all cover penetrations. Thus the owner or operator shall monitor any openings that are within an area of the landfill where waste has been placed and a gas collection system is required. The owner or operator shall establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan shall be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30 meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.

(e) Operate the system such that all collected gases are vented to a control system designed and operated in compliance with subparagraph (1)(b) of this rule. In the event the collection or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within 1 hour of the collection or control system not operating.

(f) Operate the control system at all times when the collected gas is routed to the system.

(g) If monitoring demonstrates that the operational requirements in subparagraphs (b), (c), or (d) of this paragraph are not met, corrective action shall be taken as specified in subparagraphs (4)(a)3. and 5. or subparagraph (4)(c) of this rule. If corrective actions are taken as specified in paragraph (4) of this rule, the monitored exceedance is not a violation of the operational requirements in this paragraph.

(3) Test Methods and Procedures.

(a) *NMOC Emission Rate.* The landfill owner or operator shall calculate the NMOC emission rate using either the equation provided in subparagraph (a)1. of this paragraph or the equation provided in subparagraph (a)1.(ii) of this paragraph. Both equations may be used if the actual year-to-year solid waste acceptance rate is known, as specified in subparagraph (a)1. of this paragraph, for part of the life of the landfill and the actual year-to-year solid waste acceptance rate is unknown, as specified in subparagraph (a)1.(ii) of this paragraph, for part of the life of the landfill. The values to be used in both equations are 0.05 per year for k, 170 cubic meters per megagram for L_o, and 4,000 parts per million by volume as hexane for the C_{NMOC}. For landfills located in geographical areas with a 30-year annual average precipitation of less than 25 inches, as measured at the nearest representative official meteorological site, the k value to be used is 0.02 per year.

1. The following equation shall be used if the actual year-to-year solid waste acceptance rate is known.

$$M_{NMOC} = \sum_{i=1}^{n} 2kL_o M_i \left(e^{-kt_i}\right)\left(C_{NMOC}\right)\left(3.6 \times 10^{-9}\right)$$

where,

M_{NMOC} = Total NMOC emission rate from the landfill, megagrams per year

k = methane generation rate constant, $year^{-1}$

L_o = methane generation potential, cubic meters per megagram solid waste

M_i = mass of solid waste in the i^{th} section, megagrams

t_i = age of the i^{th} section, years

C_{NMOC} = concentration of NMOC, parts per million by volume as hexane

3.6×10^{-9} = conversion factor

(i) The mass of nondegradable solid waste may be subtracted from the total mass of solid waste in a particular section of the landfill when calculating the value for M_i if the documentation of the nature and amount of such wastes is maintained.

(ii) The following equation shall be used if the actual year-to-year solid waste acceptance rate is unknown.

$$M_{NMOC} = 2L_o R\left(e^{-kc} - e^{-kt}\right)\left(C_{NMOC}\right)\left(3.6 \times 10^{-9}\right)$$

where,

M_{NMOC} = mass emission rate of NMOC, megagrams per year

L_o = methane generation potential, cubic meters per megagram solid waste

R = average annual acceptance rate, megagrams per year

k = methane generation rate constant, $year^{-1}$

t = age of landfill, years

C_{NMOC} = concentration of NMOC, parts per million by volume as hexane

c = time since closure, years. For active landfill c = 0 and $e^{-kc} = 1$

3.6×10^{-9} = conversion factor

(iii) The mass of nondegradable solid waste may be subtracted from the total mass of solid waste in a particular section of the landfill when calculating a value for R, if the documentation of the nature and amount of such wastes is maintained.

2. Tier 1. The owner or operator shall compare the calculated NMOC mass emission rate to the standard of 34 megagrams per year.

(i) If the NMOC emission rate calculated in subparagraph (a) of this paragraph is less than 34 megagrams per year, then the landfill owner or operator shall submit an NMOC emission rate report as provided in subparagraph (6)(b)1. of this rule, and shall recalculate the NMOC mass emission rate annually as required under subparagraph (1)(d)1. of this rule.

(ii) If the calculated NMOC emission rate is equal to or greater than 34 megagrams per year, then the landfill owner or operator shall either:

(I) Submit a gas collection and control system design plan within 1 year as specified in subparagraph (6)(c) of this rule, and install and operate a gas

collection and control system within 30 months according to subparagraphs (1)(a) and (b) of this rule;

(II) Determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the Tier 2 procedures provided in subparagraph (3)(a)3. of this paragraph; or

(III) Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the Tier 3 procedures provided in subparagraph (3)(a)4. of this paragraph.

3. Tier 2. The landfill owner or operator shall determine the site-specific NMOC concentration using the following sampling procedure. The landfill owner or operator shall install at least two sample probes per hectare, evenly distributed over the landfill surface that has retained waste for at least 2 years. If the landfill is larger than 25 hectares in area, only 50 samples are required. The probes should be evenly distributed across the sample area. The sample probes should be located to avoid known areas of nondegradable solid waste. The owner or operator shall collect and analyze one sample of landfill gas from each probe to determine the NMOC concentration using Method 25 or 25C of Appendix A of 40 CFR Part 60. Taking composite samples from different probes into a single cylinder is allowed; however, equal sample volumes shall be taken from each probe. For each composite, the sampling rate, collection times, beginning and ending cylinder vacuums, or alternative volume measurements shall be recorded to verify that composite volumes are equal. Composite sample volumes should not be less than one liter unless evidence can be provided to substantiate the accuracy of smaller volumes. Terminate compositing before the cylinder approaches ambient pressure where measurement accuracy diminishes. If more than the required number of samples is taken, all samples shall be used in the analysis. The landfill owner or operator shall divide the NMOC concentration from Method 25 or 25C by six to convert from C_{NMOC} as carbon to C_{NMOC} as hexane. If the landfill has an active or passive gas removal system in place, Method 25 or 25C samples may be collected from these systems instead of surface probes provided the removal system can be shown to provide sampling as representative as the two sampling probe per hectare requirement. For active collection systems, samples may be collected from the common header pipe. The sample location on the common header pipe shall be before any gas moving, condensate removal, or treatment system equipment. For active collection systems, a minimum of three samples shall be collected from the header pipe. [**NOTE:** Test Methods found in Appendix A of 40 CFR part 60 are incorporated by reference in ADEM Admin. Code r. 335-3-10-.03.]

(i) Within 60 days after the date of determining the NMOC concentration and corresponding NMOC emission rate, the owner or operator shall submit the results according to subparagraph (6)(i)2. of this rule.

(ii) The landfill owner or operator shall recalculate the NMOC mass emission rate using the equations provided in subparagraph (3)(a)1. or (a)1.(ii) of this paragraph and using the average site-specific NMOC concentration from the collected samples instead of the default value in the equation provided in subparagraph (a) of this paragraph.

(iii) If the resulting NMOC mass emission rate is less than 34 megagrams per year, the owner or operator shall submit a periodic estimate of the NMOC emissions in an NMOC emission rate report as provided in subparagraph (6)(b)1. of this rule and shall recalculate the NMOC mass emission rate annually as required under subparagraphs (1)(a) and (b) of this rule. The site-specific NMOC concentration shall be retested every 5 years using the methods specified in this paragraph.

(iv) If the NMOC mass emission rate as calculated using the Tier 2 site-specific NMOC concentration is equal to or greater than 34 megagrams per year, the owner or operator shall either:

(I) Submit a gas collection and control system design plan within 1 year as specified in subparagraph (6)(c) of this rule, and install and operate a gas collection and control system within 30 months according to subparagraphs (1)(a) and (b) of this rule;

(II) Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the site-specific methane generation rate using the Tier 3 procedures specified in subparagraph (3)(a)4. of this paragraph; or

(III) Conduct a surface emission monitoring demonstration using the Tier 4 procedures specified in subparagraph (a)6 of this paragraph.

4. Tier 3. The site-specific methane generation rate constant shall be determined using the procedures provided in Method 2E of Appendix A. The landfill owner or operator shall estimate the NMOC mass emission rate using equations in subparagraph (a)1. or (a)1.(ii) of this paragraph and using a site-specific methane generation rate constant k, and the site-specific NMOC concentration as determined in subparagraph (a)3. of this paragraph instead of the default values provided in subparagraph (a) of this paragraph. The landfill owner or operator shall compare the resulting NMOC mass emission rate to the standard of 34 megagrams per year.

(i) If the NMOC mass emission rate as calculated using the Tier site-specific methane generation rate and concentration of NMOC is equal to or greater than 50 megagrams per year, the owner or operator shall comply with subparagraph (1)(b)2. of this Rule.

(I) Submit a gas collection and control system design plan within 1 year as specified in subparagraph (6)(c) of this rule, and install and operate a gas

collection and control system within 30 months according to subparagraphs (1)(a) and (b) of this rule; or

(II) Conduct a surface emission monitoring demonstration using the Tier 4 procedures specified in subparagraph (3)(a)6. of this paragraph.

(ii) If the NMOC mass emission rate is less than 34 megagrams per year, then the owner or operator shall recalculate the NMOC mass emission rate annually using either equation in subparagraph (a)1. of this paragraph and using the site-specific Tier 2 NMOC concentration and Tier 3 methane generation rate constant and submit a periodic NMOC emission rate report as provided in subparagraph (6)(b) of this rule. The calculation of the methane generation rate constant is performed only once, and the value obtained from this test shall be used in all subsequent annual NMOC emission rate calculations.

5. *Other methods.* The owner or operator may use other methods to determine the NMOC concentration or a site-specific k as an alternative to the methods required in subparagraphs (a)3. and (a)4. of this paragraph if the method has been approved by the Administrator.

6. *Tier 4.* The landfill owner or operator shall demonstrate that surface methane emissions are below 500 parts per million. Surface emission monitoring shall be conducted on a quarterly basis using the following procedures. Tier 4 is allowed only if the landfill owner or operator can demonstrate that NMOC emissions are greater than or equal to 34 Mg/yr but less than 50 Mg/yr using Tier 1 or Tier 2. If both Tier 1 and Tier 2 indicate NMOC emissions are 50 Mg/yr or greater, then Tier 4 cannot be used. In addition, the landfill shall meet the criteria in subparagraph (a)6.(viii) of this paragraph.

(i) The owner or operator shall measure surface concentrations of methane along the entire perimeter of the landfill and along a pattern that traverses the landfill at no more than 30-meter intervals using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in subparagraph (4)(d) of this rule.

(ii) The background concentration shall be determined by moving the probe inlet upwind and downwind at least 30 meters from the waste mass boundary of the landfill.

(iii) Surface emission monitoring shall be performed in accordance with section 8.3.1 of Method 21 of appendix A of 40 CFR Part 60, except that the probe inlet shall be placed no more than 5 centimeters above the landfill surface; the constant measurement of distance above the surface should be based on a mechanical device such as with a wheel on a pole.

(I) The owner or operator shall use a wind barrier, similar to a funnel, when onsite average wind speed exceeds 4 miles per hour or 2 meters per second or gust exceeding 10 miles per hour. Average on-site wind speed shall also be determined in an open area at 5-minute intervals using an on-site

anemometer with a continuous recorder and data logger for the entire duration of the monitoring event. The wind barrier shall surround the SEM monitor, and shall be placed on the ground, to ensure wind turbulence is blocked. SEM cannot be conducted if average wind speed exceeds 25 miles per hour.

(II) Landfill surface areas where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover, and all cover penetrations shall also be monitored using a device meeting the specifications provided in subparagraph (4)(d) of this rule.

(iv) Each owner or operator seeking to comply with the Tier 4 provisions in subparagraph (a)6. of this paragraph shall maintain records of surface emission monitoring as provided in subparagraph(7)(g) of this rule, and submit a Tier 4 surface emissions report as provided in subparagraph (6)(c)4.(iii) of this rule.

(v) If there is any measured concentration of methane of 500 parts per million or greater from the surface of the landfill, the owner or operator shall submit a gas collection and control system design plan within 1 year of the first measured concentration of methane of 500 parts per million or greater from the surface of the landfill according to subparagraph (6)(c) of this rule, and install and operate a gas collection and control system according to subparagraphs (1)(a) and (b) of this rule, within 30 months of the most recent NMOC emission rate report in which the NMOC emission rate equals or exceeds 34 megagrams per year based on Tier 2.

(vi) If after four consecutive quarterly monitoring periods at a landfill, other than a closed landfill, there is no measured concentration of methane of 500 parts per million or greater from the surface of the landfill, the owner or operator shall continue quarterly surface emission monitoring using the methods specified in this paragraph.

(vii) If after four consecutive quarterly monitoring periods at a closed landfill there is no measured concentration of methane of 500 parts per million or greater from the surface of the landfill, the owner or operator shall conduct annual surface emission monitoring using the methods specified in this paragraph.

(viii) If a landfill has installed and operates a collection and control system that is not required by this Chapter, then the collection and control system shall meet the following criteria:

(I) The gas collection and control system shall have operated for at least 6,570 out of 8,760 hours preceding the Tier 4 surface emissions monitoring demonstration.

(II) During the Tier 4 surface emissions monitoring demonstration, the gas collection and control system shall operate as it normally would to collect and control as much landfill gas as possible.

(b) After the installation and startup of a collection and control system in compliance with paragraph (4) of this rule, the owner or operator shall calculate the NMOC emission rate for purposes of determining when the system can be capped, removed, or decommissioned as provided in subparagraph (1)(e) of this rule, using the following equation:

$$M_{NMOC} = 1.89 \times 10^{-3} (Q_{LFG})(C_{NMOC})$$

where,

M_{NMOC} = mass emission rate of NMOC, megagrams per year

Q_{LFG} = flow rate of landfill gas, cubic meters per minute

C_{NMOC} = NMOC concentration, parts per million by volume as hexane

1. The flow rate of landfill gas, Q_{LFG}, shall be determined by measuring the total landfill gas flow rate at the common header pipe that leads to the control device using a gas flow measuring device calibrated according to the provisions of Section 10 of Method 2E of Appendix A.

2. The average NMOC concentration, C_{NMOC}, shall be determined by collecting and analyzing landfill gas sampled from the common header pipe before the gas moving or condensate removal equipment using the procedures in Method 25 or 25C or Method 18 of Appendix A. If using Method 18, the minimum list of compounds to be tested shall be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42). The sample location on the common header pipe shall be before any condensate removal or other gas refining units. The landfill owner or operator shall divide the NMOC concentration from Method 25 or 25C by six to convert from C_{NMOC} as carbon to C_{NMOC} as hexane.

3. The owner or operator may use another method to determine landfill gas flow rate and NMOC concentration if the method has been approved by the Director.

(i) Within 60 days after the date of calculating the NMOC emission rate for purposes of determining when the system can be capped or removed, the owner or operator shall submit the results according to subparagraph (6)(i)2. of this rule.

(ii) [Reserved]

(c) When calculating emissions for PSD purposes, the owner or operator of each MSW landfill subject to the provisions of this Chapter shall estimate the NMOC emission rate for comparison to the PSD major source and significance levels in rule 335-3-14-.04(2)(w) using AP-42 or other approved measurement procedures.

(d) For the performance test required in subparagraph (1)(b)1. of this rule, the net heating value of the combusted landfill gas as determined in 40 CFR §60.18(f)(3) is calculated from the concentration of methane in the landfill gas as measured by Method 3C. A minimum of three 30-minute Method 3C samples are determined. The measurement of other organic components, hydrogen, and carbon monoxide is not applicable. Method 3C may be used to determine the landfill gas molecular weight for calculating the flare gas exit velocity under 40 CFR § 60.18(f)(4).

1. Within 60 days after the date of completing each performance test (as defined in 40 CFR § 60.8), the owner or operator shall submit the results of the performance tests required by paragraph (b) or (d) of this section, including any associated fuel analyses, according to subparagraph (6)(i)1. of this rule.

2. [Reserved].

(e) For the performance test required in subparagraph (i)(b)2., Method 25 or 25C or Method 18 (Method 25C may be used at the inlet only) shall be used to determine compliance with 98 weight-percent efficiency or the 20 ppmv outlet NMOC concentration level, unless another method to demonstrate compliance has been approved by the Director as provided by subparagraph (6)(c)2. of this rule. If using Method 18, the minimum list of compounds to be tested shall be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42). Method 3, 3A, or 3C shall be used to determine oxygen for correcting the NMOC concentration as hexane to 3 percent. In cases where the outlet concentration is less than 50 ppm NMOC as carbon (8 ppm NMOC as hexane), Method 25A should be used in place of Method 25. Method 18 may be used in conjunction with Method 25A on a limited basis (compound specific, *e.g.*, methane) or Method 3C may be used to determine methane. The methane as carbon should be subtracted from the Method 25A total hydrocarbon value as carbon to give NMOC concentration as carbon. The landfill owner or operator shall divide the NMOC concentration as carbon by 6 to convert the C_{NMOC} as carbon to C_{NMOC} as hexane. The following equation shall be used to calculate efficiency:

$$\text{Control Efficiency} = \left(NMOC_{in} - NMOC_{out}\right) \Big/ NMOC_{in}$$

where,

$NMOC_{in}$ = mass of NMOC entering control device

$NMOC_{out}$ = mass of NMOC exiting control device

1. Within 60 days after the date of completing each performance test (as defined in 40 CFR § 60.8), the owner or operator shall submit the results of the performance tests, including any associated fuel analyses, according to subparagraph (6)(i)1. of this rule.

2. [Reserved].

(4) Compliance Provisions: For an MSW landfill with a gas collection and control system used to comply with subparagraphs (1)(a) and (b) of this rule, the owner or operator shall operate the gas collection and control system in accordance with the compliance provisions in this section (as well as the provisions in paragraphs (2) and (5) of this rule, or the compliance provisions in 40 CFR §63.1960, as incorporated by reference under ADEM Admin. Code r. 335-3-11-.06(78) (as well as the provisions in 40 CFR §§ 63.1958 and 63.1961, as incorporated by reference under ADEM Admin. Code r. 335-3-11-.06(78)), or both as alternative means of compliance. For a MSW landfill with a gas collection and control system used to comply with the provisions of subparagraphs (1)(a) and (b) of this rule, once the owner or operator begins to comply with the provisions of 40 CFR § 63.1960, as incorporated by reference under ADEM Admin. Code r. 335-3-11-.06(78), the owner or operator shall continue to operate the collection and control device according to those provisions and cannot return to the provisions of this paragraph.

(a) Except as provided in subparagraph (6)(c)2. of this rule, the specified methods in subparagraphs (a)1. through (a)6. of this paragraph shall be used to determine whether the gas collection system is in compliance with subparagraph (1)(b)2.(ii) of this rule.

1. For the purposes of calculating the maximum expected gas generation flow rate from the landfill to determine compliance with subparagraph (1)(a)2.(i) of this rule, one of the following equations shall be used. The k and L_o kinetic factors should be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42) or other site-specific values demonstrated to be appropriate and approved by the Director. If k has been determined as specified in subparagraph (3)(a)4. of this rule, the value of k determined from the test shall be used. A value of no more than 15 years shall be used for the intended use period of the gas mover equipment. The active life of the landfill is the age of the landfill plus the estimated number of years until closure.

(i) For sites with unknown year-to-year solid waste acceptance rate:

$$Q_m = 2L_o R\left(e^{-kc} - e^{-kt}\right)$$

where,

Q_m = maximum expected gas generation flow rate, cubic meters per year

L_o = methane generation potential, cubic meters per megagram solid waste

R = average annual acceptance rate, megagrams per year

k = methane generation rate constant, $year^{-1}$

t = age of the landfill at equipment installation plus the time the owner or operator intends to use the gas mover equipment or active life of the landfill, whichever is less. If the equipment is installed after closure, t is the age of the landfill at installation, years

c = time since closure, years (for an active landfill c = 0 and $e^{-kc} = 1$)

(ii) For sites with known year-to-year solid waste acceptance rate:

$$Q_m = \sum_{i=1}^{n} 2kL_o M_i \left(e^{-kt_i}\right)$$

where,

Q_m = maximum expected gas generation flow rate, cubic meters per year

k = methane generation rate constant, $year^{-1}$

L_o = methane generation potential, cubic meters per megagram solid waste

M_i = mass of solid waste in the i^{th} section, megagrams

t_i = age of the i^{th} section, years

(iii) If a collection and control system has been installed, actual flow data may be used to project the maximum expected gas generation flow rate instead of, or in conjunction with, the equations in subparagraphs (a)1.(i) and (ii) of this paragraph. If the landfill is still accepting waste, the actual measured flow data will not equal the maximum expected gas generation rate, so calculations using the equations in subparagraphs (a)1.(i) or (ii) or other methods shall be used to predict the maximum expected gas generation rate over the intended period of use of the gas control system equipment.

2. For the purposes of determining sufficient density of gas collectors for compliance with subparagraph (1)(a)2.(ii) of this rule., the owner or operator shall design a system of vertical wells, horizontal collectors, or other collection devices, satisfactory to the Director, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards.

3. For the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with subparagraph (1)(a)2.(iii) of this rule, the owner or operator shall measure gauge pressure in the gas collection header at each individual well, monthly. If a positive pressure exists, action shall be initiated to correct the exceedance within 5 calendar days, except for the three conditions allowed under subparagraph (2)(b) of this rule. Any attempted corrective measure shall not cause exceedances of other operational or performance standards.

(i) If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement of positive pressure, the owner or operator shall conduct a root cause analysis and correct the exceedance as soon as practicable, but not later than 60 days after positive pressure was first measured. The owner or operator shall keep records according to subparagraph (7)(e)3 of this rule.

(ii) If corrective actions cannot be fully implemented within 60 days following the positive pressure measurement for which the root cause analysis was required, the owner or operator shall also conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the measurement of landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit) or positive pressure. The owner or operator shall submit the items listed in subparagraph (6)(g)7. of this rule as part of the next annual report. The owner or operator shall keep records according to subparagraph (7)(e)4. of this rule.

(iii) If corrective action is expected to take longer than 120 days to complete after the initial exceedance, the owner or operator shall submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Director, according to subparagraph (6)(g)7. and (j) of this rule. The owner or operator shall keep records according to subparagraph (7)(e)5. of this rule.

4. [Reserved].

5. For the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator shall monitor each well monthly for temperature as provided in subparagraph (2)(c) of this rule. If a well exceeds the operating parameter for temperature, action shall be initiated to correct the exceedance within 5 calendar days. Any attempted corrective measure shall not cause exceedances of other operational or performance standards.

(i) If a landfill gas temperature less than 55 degrees Celsius (131 degrees Fahrenheit) cannot be achieved within 15 calendar days of the first measurement of landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit), the owner or operator shall conduct a root cause analysis and correct the exceedance as soon as practicable, but no later than 60 days after a landfill gas temperature greater than 55 degrees Celsius (131 degrees

Fahrenheit) was first measured. The owner or operator shall keep records according to subparagraph (7)(e)3. of this rule.

(ii) If corrective actions cannot be fully implemented within 60 days following the positive pressure measurement for which the root cause analysis was required, the owner or operator shall also conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the measurement of landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit). The owner or operator shall submit the items listed in subparagraph (6)(g)7. of this rule, as part of the next annual report. The owner or operator shall keep records according to subparagraph (7)(e)4. of this rule.

(iii) If corrective action is expected to take longer than 120 days to complete after the initial exceedance, the owner or operator shall submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Director, according to subparagraphs (6)(g)7. and (j) of this rule. The owner or operator shall keep records according to subparagraph (7)(e)5. of this rule.

6. An owner or operator seeking to demonstrate compliance with subparagraph (l)(a)2.(iv) of this rule through the use of a collection system not conforming to the specifications provided in paragraph (8) of this rule shall provide information satisfactory to the Director as specified in subparagraph (6)(c)3. of this rule demonstrating that off-site migration is being controlled.

(b) For purposes of compliance with subparagraph (2)(a) of this rule, each owner or operator of a controlled landfill shall place each well or design component as specified in the approved design plan as provided in subparagraph (6)(c) of this rule. Each well shall be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of:

1. 5 years or more if active; or

2. 2 years or more if closed or at final grade.

(c) The following procedures shall be used for compliance with the surface methane operational standard as provided in subparagraph (2)(d) of this rule.

1. After installation and startup of the gas collection system, the owner or operator shall monitor surface concentrations of methane along the entire perimeter of the collection area and along a pattern that traverses the landfill at no more than 30 meter intervals (or a site-specific established spacing) for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in subparagraph (d) of this paragraph.

2. The background concentration shall be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at a distance of at least 30 meters from the perimeter wells.

3. Surface emission monitoring shall be performed in accordance with Section 8.3.1 of Method 21 of Appendix A of 40 CFR Part 60, except that the probe inlet shall be placed within 5 to 10 centimeters of the ground. Monitoring shall be performed during typical meteorological conditions.

4. Any reading of 500 parts per million or more above background at any location shall be recorded as a monitored exceedance and the actions specified in subparagraphs (c)4.(i) through (v) of this paragraph below shall be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of subparagraph (2)(d) of this rule.

(i) The location of each monitored exceedance shall be marked and the location and concentration recorded. For location, the owner or operator shall determine the latitude and longitude coordinates using an instrument with an accuracy of at least 4 meters. The coordinates shall be in decimal degrees with at least five decimal places.

(ii) Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance shall be made and the location shall be re-monitored within 10 calendar days of detecting the exceedance.

(iii) If the re-monitoring of the location shows a second exceedance, additional corrective action shall be taken and the location shall be monitored again within 10 days of the second exceedance. If the re-monitoring shows a third exceedance for the same location, the action specified in subparagraph (c)4.(v) of this paragraph shall be taken, and no further monitoring of that location is required until the action specified in subparagraph (c)4.(v) has been taken.

(iv) Any location that initially showed an exceedance but has a methane concentration less than 500 ppm methane above background at the 10-day re-monitoring specified in subparagraph (c)4.(ii) or (iii) of this paragraph shall be re-monitored 1 month from the initial exceedance. If the 1-month remonitoring shows a concentration less than 500 parts per million above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1-month remonitoring shows an exceedance, the actions specified in subparagraph (c)4.(iii) or (v) of this paragraph shall be taken.

(v) For any location where monitored methane concentration equals or exceeds 500 parts per million above background three times within a quarterly period, a new well or other collection device shall be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and

a corresponding timeline for installation may be submitted to the Director for approval.

5. The owner or operator shall implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis.

(d) Each owner or operator seeking to comply with the provisions in subparagraph (c) of this paragraph shall comply with the following instrumentation specifications and procedures for surface emission monitoring devices:

1. The portable analyzer shall meet the instrument specifications provided in Section 6 of Method 21 of Appendix A, except that "methane" shall replace all references to VOC.

2. The calibration gas shall be methane, diluted to a nominal concentration of 500 parts per million in air.

3. To meet the performance evaluation requirements in Section 8.1 of Method 21 of Appendix A, the instrument evaluation procedures of Section 8.1 of Method 21 of Appendix A shall be used.

4. The calibration procedures provided in Section 8 and 10 of Method 21 of Appendix A shall be followed immediately before commencing a surface monitoring survey.

(e) The provisions of this paragraph apply at all times, including periods of startup, shutdown, or malfunction. During periods of startup, shutdown, and malfunction, the owner or operator shall comply with the work practice specified in subparagraph (2)(e) of this rule, in lieu of the compliance provisions in paragraph (4) of this rule.

(5) Monitoring of Operations: For an MSW landfill with a gas collection and control system used to comply with subparagraphs (1)(a) and (b) of this rule, the owner or operator shall operate the gas collection and control system in accordance with the monitoring provisions in this section (as well as the provisions in paragraphs (2) and (4) of this rule, except as provided in subparagraph (6)(d)2., or the monitoring provisions in 40 CFR § 63.1961, as incorporated by reference under ADEM Admin. Code r. 335-3-11-.06(78) (as well as the provisions in 40 CFR §§ 63.1958 and 63.1960, as incorporated by reference under ADEM Admin. Code r. 335-3-11-.06(78)), or both as alternative means of compliance. Once the owner or operator begins to comply with the provisions of 40 CFR § 63.1961, as incorporated by reference under ADEM Admin. Code r. 335-3-11-.06(78), the owner or operator shall continue to operate the collection and control device according to those provisions and cannot return to the provisions of this paragraph. Except as provided in subparagraph (6)(c)2. of this rule,

(a) Each owner or operator seeking to comply with subparagraph (l)(a)2. of this rule for an active gas collection system shall install a sampling port and

a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead and:

1. Measure the gauge pressure in the gas collection header on a monthly basis as provided in subparagraph (4)(a)3. of this rule; and

2. Monitor nitrogen or oxygen concentration in the landfill gas on a monthly basis as follows:

(i) The nitrogen level shall be determined using Method 3C, unless an alternative test method is established as allowed by subparagraph (6)(c)2. of this rule.

(ii) Unless an alternative test method is established as allowed by subparagraph (6)(c)2. of this rule, the oxygen level shall be determined by an oxygen meter using Method 3A, 3C, or ASTM D6522-11 (incorporated by reference, see 40 CFR § 60.17). Determine the oxygen level by an oxygen meter using Method 3A, 3C, or ASTM D6522-11 (if sample location is prior to combustion) except that:

(I) The span shall be set between 10 and 12 percent oxygen;
(II) A data recorder is not required;

(III) Only two calibration gases are required, a zero and span;

(IV) A calibration error check is not required; and

(V) The allowable sample bias, zero drift, and calibration drift are ±10 percent.

(iii) A portable gas composition analyzer may be used to monitor the oxygen levels provided:

(I) The analyzer is calibrated; and

(II) The analyzer meets all quality assurance and quality control requirements for Method 3A or ASTM D6522-11 (incorporated by reference, see 40 CFR § 60.17).

3. Monitor temperature of the landfill gas on a monthly basis as provided in subparagraph (4)(a)5. of this rule. The temperature measuring device shall be calibrated annually using the procedure in this 40 CFR Part 60, Appendix A-1, Method 2, Section 10.3.

(b) Each owner or operator seeking to comply with subparagraph (1)(b)2.(iii) of this rule using an enclosed combustor shall calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment.

1. A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of ±1 percent of the temperature being measured expressed in °Celsius or ±0.5 °C, whichever is greater. A temperature

monitoring device is not required for boilers or process heaters with design heat input capacity equal to or greater than 44 megawatts.

2. A device that records flow to the control device and bypass of the control device (if applicable). The owner or operator shall:

(i) Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes; and

(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(c) Each owner or operator seeking to comply with subparagraph (l)(b) of this rule using an open flare shall install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment:

1. A heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame.

2. A device that records flow to the flare and bypass of the flare (if applicable). The owner or operator shall:

(i) Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes; and

(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(d) Each owner or operator seeking to demonstrate compliance with subparagraph (1)(b)2.(iii) of this rule using a device other than an open flare or an enclosed combustor or a treatment system shall provide information satisfactory to the Director as provided in subparagraph (6)(c)2. of this rule describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Director shall review the information and either approve it, or request that additional information be submitted. The Director may specify additional appropriate monitoring procedures.

(e) Each owner or operator seeking to install a collection system that does not meet the specifications in paragraph (8) of this rule or seeking to monitor alternative parameters to those required by paragraphs (2) through (5) of this rule shall provide information satisfactory to the Director as provided in subparagraphs (6)(c)2. And 3. of this rule describing the design and operation of

the collection system, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Director may specify additional appropriate monitoring procedures.

(f) Each owner or operator seeking to demonstrate compliance with the 500 parts per million surface methane operational standard in subparagraph (2)(d) of this rule, shall monitor surface concentrations of methane according to the procedures provided in subparagraph (4)(c) of this rule, and the instrument specifications in subparagraph (4)(d) of this rule. Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 ppm or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.

(g) Each owner or operator seeking to demonstrate compliance with the control system requirements in subparagraph (l)(b) of this rule, using a landfill gas treatment system shall maintain and operate all monitoring systems associated with the treatment system in accordance with the site-specific treatment system monitoring plan required in subparagraph (7)5.(ii) of this rule, and shall calibrate, maintain, and operate according to the manufacturer's specifications a device that records flow to the treatment system and bypass of the treatment system (if applicable). The owner or operator shall:

1. Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the treatment system at least every 15 minutes; and

2. Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(h) The monitoring requirements of subparagraphs (b), (c) (d) and (g) of this paragraph apply at all times the affected source is operating, except for periods of monitoring system malfunctions, repairs associated with monitoring system malfunctions, and required monitoring system quality assurance or quality control activities. A monitoring system malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring system failures that are caused in part by poor maintenance or careless operation are not malfunctions. The owner or operator shall complete monitoring system repairs in response to monitoring system malfunctions and to return the monitoring system to operation as expeditiously as practicable.

(6) Reporting Requirements. Except as provided 40 CFR § 60.24 and in subparagraph (6)(c)2. of this rule,

(a) *Design capacity report.* Each owner or operator subject to the requirements of this Chapter shall submit an initial design capacity report to the Director.

1. The initial design capacity report shall fulfill the requirements of the notification of the date construction is commenced as required under § 60.7(a)(1), 40 CFR and shall be submitted no later than 90 days from the effective date of these rules.

2. The initial design capacity report shall contain the following information:

(i) A map or plot of the landfill, providing the size and location of the landfill, and identifying all areas where solid waste may be landfilled according to the provisions of the State permit;

(ii) The maximum design capacity of the landfill. Where the maximum design capacity is specified in the State permit, a copy of the permit specifying the maximum design capacity may be submitted as part of the report. If the maximum design capacity of the landfill is not specified in the permit, the maximum design capacity shall be calculated using good engineering practices. The calculations shall be provided, along with the relevant parameters as part of the report. The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. If the owner or operator chooses to convert the design capacity from volume to mass or from mass to volume to demonstrate its design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, the calculation shall include a site-specific density, which shall be recalculated annually. Any density conversions shall be documented and submitted with the design capacity report. The Director may request other reasonable information as may be necessary to verify the maximum design capacity of the landfill.

(b) *Amended design capacity report.* An amended design capacity report shall be submitted to the Director providing notification of any increase in the design capacity of the landfill, within 90 days of an increase in the maximum design capacity of the landfill to meet or exceed 2.5 million megagrams and 2.5 million cubic meters. This increase in design capacity may result from an increase in the permitted volume of the landfill or an increase in the density as documented in the annual recalculation required in subparagraph (7)(f) of this rule.

(c) *NMOC emission rate report.* Each owner or operator of an existing MSW landfill subject to the requirements of this Chapter with a design capacity equal to or greater than 2.5million megagrams and 2.5 million cubic meters, shall submit an NMOC emission rate report to the Director annually following the procedure specified in subparagraph (i)2. of this paragraph, except as provided for in subparagraph (b)3. of this paragraph. The Director may request such additional information as may be necessary to verify the reported NMOC emission rate.

1. The NMOC emission rate report shall contain an annual or 5-year estimate of the NMOC emission rate calculated using the formula and procedures provided in subparagraphs (3)(a) or (b) of this rule, as applicable.

(i) The NMOC emission rate report shall be submitted following the procedure specified in subparagraph (i)2. of this paragraph no later than 90 days from the effective date of these rules. 2. The NMOC emission rate report shall include all the data, calculations, sample reports and measurements used to estimate the annual or 5-year emissions.

3. If the estimated NMOC emission rate as reported in the annual report to the Director is less than 34 megagrams per year in each of the next 5 consecutive years, the owner or operator may elect to submit, following the procedure specified in subparagraph (i)2. of this paragraph, an estimate of the NMOC emission rate for the next 5-year period in lieu of the annual report. This estimate shall include the current amount of solid waste-in-place and the estimated waste acceptance rate for each year of the 5 years for which an NMOC emission rate is estimated. All data and calculations upon which this estimate is based shall be provided to the Director. This estimate shall be revised at least once every 5 years. If the actual waste acceptance rate exceeds the estimated waste acceptance rate in any year reported in the 5-year estimate, a revised 5-year estimate shall be submitted to the Director. The revised estimate shall cover the 5-year period beginning with the year in which the actual waste acceptance rate exceeded the estimated waste acceptance rate.

4. Each owner or operator subject to the requirements of this Chapter is exempted to submit an NMOC emission rate report after the installation of a collection and control system in compliance with subparagraphs (l)(a) and (b) of this rule, during such time as the collection and control system is in operation and in compliance with paragraphs (2) and (4) of this rule.

(d) *Collection and control system design plan.* A design plan for each gas collection and control system shall be prepared and approved by a professional engineer and shall meet the following requirements:

1. The collection and control system as described in the design plan shall meet the design requirements in subparagraphs (l)(a) and (b) of this rule.

2. The collection and control system design plan shall include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping, or reporting provisions of paragraphs (4) through (7) of this rule, proposed by the owner or operator.

3. The collection and control system design plan shall either conform to specifications for active collection systems in paragraph (8) of this rule, or include a demonstration to the Director's satisfaction of the sufficiency of the alternative provisions to paragraph (8) of this rule.

4. Each owner or operator of an MSW landfill having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters shall submit a copy of the collection and control system design plan cover page that contains the engineer's seal to the Director within 1 year of the first NMOC emission rate report in which the NMOC emission rate equals or exceeds 34 megagrams per year, except as follows::

(i) If the owner or operator elects to recalculate the NMOC emission rate after Tier 2 NMOC sampling and analysis as provided in subparagraph (3)(a)3. of this rule and the resulting rate is less than 34 megagrams per year, annual periodic reporting shall be resumed, using the Tier 2 determined site-specific NMOC concentration, until the calculated NMOC emission rate is equal to or greater than 34 megagrams per year or the landfill is closed. The revised NMOC emission rate report, with the recalculated NMOC emission rate based on NMOC sampling and analysis, shall be submitted, following the procedures in subparagraph (6)(i)2. of this rule, within 180 days of the first calculated exceedance of 34 megagrams per year.

(ii) If the owner or operator elects to recalculate the NMOC emission rate after determining a site-specific methane generation rate constant (k), as provided in Tier 3 in subparagraph (3)(a)4. of this rule, and the resulting NMOC emission rate is less than 34 Mg/yr, annual periodic reporting shall be resumed. The resulting site-specific methane generation rate constant (k) shall be used in the NMOC emission rate calculation until such time as the emissions rate calculation results in an exceedance. The revised NMOC emission rate report based on the provisions of subparagraph (3)(a)4. of this rule and the resulting site-specific methane generation rate constant (k) shall be submitted to the Director within 1 year of the first calculated NMOC emission rate equaling or exceeding 34 megagrams per year.

(iii) If the owner or operator elects to demonstrate that site-specific surface methane emissions are below 500 parts per million methane, based on the provisions of subparagraph (3)(a)6. of this rule, then the owner or operator shall submit annually a Tier 4 surface emissions report as specified in this subparagraph (d)4.(iii) following the procedure specified in subparagraph (6)(i)2. of this paragraph until a surface emissions readings of 500 parts per million methane or greater is found. If the Tier 4 surface emissions report shows no surface emissions readings of 500 parts per million methane or greater for four consecutive quarters at a closed landfill, then the landfill owner or operator may reduce Tier 4 monitoring from a quarterly to an annual frequency. The Director may request such additional information as may be necessary to verify the reported instantaneous surface emission readings. The Tier 4 surface emissions report shall clearly identify the location, date and time (to the nearest second), average wind speeds including wind gusts, and reading (in parts per million) of any value 500 parts per million methane or greater, other than non-repeatable, momentary readings. For location, the owner or operator shall determine the latitude and longitude coordinates using an instrument with an accuracy of at

least 4 meters. The coordinates shall be in decimal degrees with at least five decimal places. The Tier 4 surface emission report should also include the results of the most recent Tier 1 and Tier 2 results in order to verify that the landfill does not exceed 50 Mg/yr of NMOC.

(I) The initial Tier 4 surface emissions report shall be submitted annually, starting within 30 days of completing the fourth quarter of Tier 4 surface emissions monitoring that demonstrates that site-specific surface methane emissions are below 500 parts per million methane, and following the procedure specified in subparagraph (6)(i)2. of this paragraph.

(II) The Tier 4 surface emissions rate report shall be submitted within 1 year of the first measured surface exceedance of 500 parts per million methane, following the procedure specified in subparagraph (6)(i)2. of this paragraph.

(iv) If the landfill is in the closed landfill subcategory, the owner or operator shall submit a collection and control system design plan to the Director within 1 year of the first NMOC emission rate report in which the NMOC emission rate equals or exceeds 50 megagrams per year, except as follows:

(I) If the owner or operator elects to recalculate the NMOC emission rate after Tier 2 NMOC sampling and analysis as provided in subparagraph (3)(a)3. of this rule, and the resulting rate is less than 50 megagrams per year, annual periodic reporting shall be resumed, using the Tier 2 determined site-specific NMOC concentration, until the calculated NMOC emission rate is equal to or greater than 50 megagrams per year or the landfill is closed. The revised NMOC emission rate report, with the recalculated NMOC emission rate based on NMOC sampling and analysis, shall be submitted, following the procedure specified in subparagraph (6)(i)2. of this paragraph, within 180 days of the first calculated exceedance of 50 megagrams per year.

(II) If the owner or operator elects to recalculate the NMOC emission rate after determining a site-specific methane generation rate constant k, as provided in Tier 3 in subparagraph (3)(a)4. of this rule, and the resulting NMOC emission rate is less than 50 megagrams per year, annual periodic reporting shall be resumed. The resulting site-specific methane generation rate constant k shall be used in the NMOC emission rate calculation until such time as the emissions rate calculation results in an exceedance. The revised NMOC emission rate report based on the provisions of subparagraph (3)(a)4. of this rule, and the resulting site-specific methane generation rate constant k shall be submitted, following the procedure specified in subparagraph (6)(i)2. of this paragraph, to the Director within 1 year of the first calculated NMOC emission rate equaling or exceeding 50 megagrams per year.

(III) The landfill owner or operator elects to demonstrate surface emissions are low, consistent with the provisions in subparagraph (d)4.(iii) of this paragraph.

(IV) The landfill has already submitted a gas collection and control system design plan consistent with the provisions of Subpart WWW of 40 CFR part 60 or any other requirements of this Chapter.

5. The landfill owner or operator shall notify the Director that the design plan is completed and submit a copy of the plan's signature page. The Director has 90 days to decide whether the design plan should be submitted for review. If the Director chooses to review the plan, the approval process continues as described in subparagraph (c)6. of this paragraph. However, if the Director indicates that submission is not required or does not respond within 90 days, the landfill owner or operator can continue to implement the plan with the recognition that the owner or operator is proceeding at their own risk. In the event that the design plan is required to be modified to obtain approval, the owner or operator shall take any steps necessary to conform any prior actions to the approved design plan and any failure to do so could result in an enforcement action.

6. Upon receipt of an initial or revised design plan, the Director shall review the information submitted under subparagraphs (6)(c)1. through 3. of this paragraph, and either approve it, disapprove it, or request that additional information be submitted. Because of the many site-specific factors involved with landfill gas system design, alternative systems may be necessary. A wide variety of system designs are possible, such as vertical wells, combination horizontal and vertical collection systems, or horizontal trenches only, leachate collection components, and passive systems. If the Director does not approve or disapprove the design plan, or does not request that additional information be submitted within 90 days of receipt, then the owner or operator may continue with implementation of the design plan, recognizing they would be proceeding at their own risk.

7. If the owner or operator chooses to demonstrate compliance with the emission control requirements of this Chapter using a treatment system as defined in this Chapter, then the owner or operator shall prepare a site-specific treatment system monitoring plan as specified in subparagraph (7)(b)5. of this rule.

(e) *Revised design plan.* The owner or operator who has already been required to submit a design plan under subparagraph (c) of this paragraph, or under Subpart WWW of 40 CFR part 60; or any other requirements of this Chapter shall submit a revised design plan to the Director for approval as follows:

1. At least 90 days before expanding operations to an area not covered by the previously approved design plan.

2. Prior to installing or expanding the gas collection system in a way that is not consistent with the design plan that was submitted to the Director according to subparagraph (c) of this paragraph.

(f) *Closure report.* Each owner or operator of a controlled landfill shall submit a closure report to the Director within 30 days of waste acceptance cessation. The Director may request additional information as may be necessary to verify that permanent closure has taken place in accordance with the requirements of ADEM Admin. Code Chapter 335-13-4. If a closure report has been submitted to the Director, no additional wastes may be placed into the landfill without filing a notification of modification as described under §60.7(a)(4), 40 CFR.

(g) *Equipment removal report.* Each owner or operator of a controlled landfill shall submit an equipment removal report to the Director 30 days prior to removal or cessation of operation of the control equipment.

1. The equipment removal report shall contain all of the following items:

(i) A copy of the closure report submitted in accordance with subparagraph (e) of this paragraph;

(ii) A copy of the initial performance test report demonstrating that the 15 year minimum control period has expired, unless the report of the results of the performance test has been submitted to the EPA via the EPA's CDX, or information that demonstrates that the GCCS will be unable to operate for 15 years due to declining gas flows. In the equipment removal report, the process unit(s) tested, the pollutant(s) tested, and the date that such performance test was conducted may be submitted in lieu of the performance test report if the report has been previously submitted to the EPA's CDX; and

(iii) Dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 34 megagrams or greater of NMOC per year, unless the NMOC emission rate reports have been submitted to the EPA via the EPA's CDX. If the NMOC emission rate reports have been previously submitted to the EPA's CDX, a statement that the NMOC emission rate reports have been submitted electronically and the dates that the reports were submitted to the EPA's CDX may be submitted in the equipment removal report in lieu of the NMOC emission rate reports; or

(iv) For the closed landfill subcategory, dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 50 megagrams or greater of NMOC per year, unless the NMOC emission rate reports have been submitted to the EPA via the EPA's CDX. If the NMOC emission rate reports have been previously submitted to the EPA's CDX, a statement that the NMOC emission rate reports have been submitted electronically and the dates that the reports were submitted to the EPA's CDX may be submitted in the equipment removal report in lieu of the NMOC emission rate reports.

2. The Director may request such additional information as may be necessary to verify that all of the conditions for removal in subparagraph (l)(e)2. of this rule have been met.

(h) *Annual report.* Each owner or operator of a landfill seeking to comply with subparagraph (1)(d) of this rule using an active collection system designed in accordance with subparagraph (l)(a) of this rule shall submit to the Director annual reports of the recorded information in subparagraphs (g)1. through (g)6. of this paragraph. The initial annual report shall be submitted within 180 days of installation and start-up of the collection and control system, and shall include the initial performance test report required under §60.8, 40 CFR as applicable, unless the report of the results of the performance test has been submitted to the EPA via the EPA's CDX. In the initial annual report, the process unit(s) tested, the pollutant(s) tested and the date that such performance test was conducted may be submitted in lieu of the performance test report if the report has been previously submitted to the EPA's CDX. The initial performance test report shall be submitted, following the procedure specified in subparagraph (i)1. of this paragraph, no later than the date that the initial annual report is submitted. For enclosed combustion devices and flares, reportable exceedances are defined under subparagraph (7)(c) of this rule. If complying with the operational provisions of 40 CFR §§ 63.1958, 63.1960, and 63.1961, as allowed in paragraphs (2), (4), and (5) of this rule, the owner or operator shall follow the semi-annual reporting requirements in §63.1981(h) in lieu of this paragraph.

1. Value and length of time for exceedance of applicable parameters monitored under subparagraphs (5)(a)1., (b), (c), (d), and (g) of this rule.

2. Description and duration of all periods when the gas stream was diverted from the control device or treatment system through a bypass line or the indication of bypass flow as specified under paragraph (5) of this rule.

3. Description and duration of all periods when the control device or treatment system was not operating and length of time the control device or treatment system was not operating.

4. All periods when the collection system was not operating.

5. The location of each exceedance of the 500 parts per million methane concentration as provided in subparagraph (2)(d) of this rule and the concentration recorded at each location for which an exceedance was recorded in the previous month. For location, the owner or operator shall determine the latitude and longitude coordinates using an instrument with an accuracy of at least 4 meters. The coordinates shall be in decimal degrees with at least five decimal places.

6. The date of installation and the location of each well or collection system expansion added pursuant to subparagraphs (a)3., (a)5., (b), and (c)4. of paragraph (4).

7. For any corrective action analysis for which corrective actions are required in subparagraph (4)(a)3. or 5. of this rule, and that take more than 60 days to correct the exceedance, the root cause analysis conducted, including a

description of the recommended corrective action(s), the date for corrective action(s) already completed following the positive pressure or elevated temperature reading, and, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates.

(i) *Initial performance test report.* Each owner or operator seeking to comply with subparagraph (l)(b) of this rule shall include the following information with the initial performance test report required under §60.8, 40 CFR:

1. A diagram of the collection system showing collection system positioning including all wells, horizontal collectors, surface collectors, or other gas extraction devices, including the locations of any areas excluded from collection and the proposed sites for the future collection system expansion;

2. The data upon which the sufficient density of wells, horizontal collectors, surface collectors, or other gas extraction devices and the gas mover equipment sizing are based;

3. The documentation of the presence of asbestos or nondegradable material for each area from which collection wells have been excluded based on the presence of asbestos or nondegradable material;

4. The sum of the gas generation flow rates for all areas from which collection wells have been excluded based on nonproductivity and the calculations of gas generation flow rate for each excluded area;

5. The provisions for increasing gas mover equipment capacity with increased gas generation flow rate, if the present gas mover equipment is inadequate to move the maximum flow rate expected over the life of the landfill; and

6. The provisions for the control of off-site migration.

(j) *Electronic reporting.* The owner or operator shall submit reports electronically according to subparagraphs (i)1. and 2. of this paragraph.

1. Within 60 days after the date of completing each performance test (as defined in 40 CFR § 60.8), the owner or operator shall submit the results of each performance test according to the following procedures:

(i) For data collected using test methods supported by the EPA's Electronic Reporting Tool (ERT) as listed on the EPA's ERT Web site (*https://www3.epa.gov/ttn/chief/ert/ert_info.html*) at the time of the test, the owner or operator shall submit the results of the performance test to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI). CEDRI can be accessed through the EPA's Central Data Exchange (CDX) (*https://cdx.epa.gov/*). Performance test data shall be submitted in a file format generated through the use of the EPA's ERT or an alternative file format consistent with the extensible markup language (XML) schema listed on the

EPA's ERT Web site, once the XML schema is available. If the owner or operator claim that some of the performance test information being submitted is confidential business information (CBI), the owner or operator shall submit a complete file generated through the use of the EPA's ERT or an alternate electronic file consistent with the XML schema listed on the EPA's ERT Web site, including information claimed to be CBI, on a compact disc, flash drive or other commonly used electronic storage media to the EPA. The electronic media shall be clearly marked as CBI and mailed to U.S. EPA/OAQPS/CORE CBI Office, Attention: Group Leader, Measurement Policy Group, MD C404-02, 4930 Old Page Rd., Durham, NC 27703. The same ERT or alternate file with the CBI omitted shall be submitted to the EPA via the EPA's CDX as described earlier in this subparagraph (i)1.(i) of this paragraph.

(ii) For data collected using test methods that are not supported by the EPA's ERT as listed on the EPA's ERT Web site at the time of the test, the owner or operator shall submit the results of the performance test to the Director at the appropriate address listed in 40 CFR § 60.4.

2. Each owner or operator required to submit reports following the procedure specified in this paragraph shall submit reports to the EPA via the CEDRI. (CEDRI can be accessed through the EPA's CDX.) The owner or operator shall use the appropriate electronic report in CEDRI for this Chapter or an alternate electronic file format consistent with the XML schema listed on the CEDRI Web site (*https://www3.epa.gov/ttn/chief/cedri/index.html*). If the reporting form specific to this Chapter is not available in CEDRI at the time that the report is due, the owner or operator shall submit the report to the Director at the appropriate address listed in §60.4. Once the form has been available in CEDRI for 90 calendar days, the owner or operator shall begin submitting all subsequent reports via CEDRI. The reports shall be submitted by the deadlines specified in this Chapter, regardless of the method in which the reports are submitted.

(k) *Corrective action and the corresponding timeline.* The owner or operator shall submit according to subparagraphs (k)1. and 2. of this paragraph. If complying with the operational provisions of 40 CFR §§ 63.1958, 63.1960, and 63.1961, as allowed in paragraphs (2), (4), and (5) of this rule, the owner or operator shall follow the corrective action and the corresponding timeline reporting requirements in 40 CFR §63.1981(j) in lieu of subparagraphs (k)(1) and (2) of this paragraph.

1. For corrective action that is required according to subparagraphs (4)(a)3.(iii) or (a)5.(iii) of this rule, and is expected to take longer than 120 days after the initial exceedance to complete, the owner or operator shall submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Director as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature monitoring value of 55 degrees Celsius (131 degrees Fahrenheit) or above. The

Director shall approve the plan for corrective action and the corresponding timeline.

2. For corrective action that is required according to subparagraphs (4)(a)3.(iii) or (a)5.(iii) of this rule, and is not completed within 60 days after the initial exceedance, the owner or operator shall submit a notification to the Director as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature exceedance.

(l) *Liquids addition.* The owner or operator of an affected landfill with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters that has employed leachate recirculation or added liquids based on a Research, Development, and Demonstration permit (issued through Resource Conservation and Recovery Act, subtitle D, part 258) within the last 10 years shall submit to the Director, annually, following the procedure specified in subparagraph (j)2. of this paragraph, the following information:

1. Volume of leachate recirculated (gallons per year) and the reported basis of those estimates (records or engineering estimates).

2. Total volume of all other liquids added (gallons per year) and the reported basis of those estimates (records or engineering estimates).

3. Surface area (acres) over which the leachate is recirculated (or otherwise applied).

4. Surface area (acres) over which any other liquids are applied.

5. The total waste disposed (megagrams) in the areas with recirculated leachate and/or added liquids based on on-site records to the extent data are available, or engineering estimates and the reported basis of those estimates.

6. The annual waste acceptance rates (megagrams per year) in the areas with recirculated leachate and/or added liquids, based on on-site records to the extent data are available, or engineering estimates.

7. The initial report shall contain items in subparagraph (k)1. through 6. of this paragraph per year for the most recent 365 days as well as for each of the previous 10 years, to the extent historical data are available in on-site records, and the report shall be submitted no later than:

(i) September 27, 2017, for landfills that commenced construction, modification, or reconstruction after July 17, 2014 but before August 29, 2016; or

(ii) 365 days after the date of commenced construction, modification, or reconstruction for landfills that commence construction, modification, or reconstruction after August 29, 2016.

8. Subsequent annual reports shall contain items in subparagraph (k)1. through 6. of this paragraph for the 365-day period following the 365-day

period included in the previous annual report, and the report shall be submitted no later than 365 days after the date the previous report was submitted.

9. Landfills in the closed landfill subcategory are exempt from reporting requirements contained in subparagraphs (k)1. through 7. of this paragraph.

10. Landfills may cease annual reporting of items in subparagraphs (k)1. through 6. of this paragraph once they have submitted the closure report in subparagraph (e) of this paragraph.

(m) *Tier 4 notification.*

1. The owner or operator of an affected landfill with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters shall provide a notification of the date(s) upon which it intends to demonstrate site-specific surface methane emissions are below 500 parts per million methane, based on the Tier 4 provisions of subparagraph (3)(a)6. of this rule. The landfill shall also include a description of the wind barrier to be used during the SEM in the notification. Notification shall be postmarked not less than 30 days prior to such date.

2. If there is a delay to the scheduled Tier 4 SEM date due to weather conditions, including not meeting the wind requirements in subparagraph (3)(a)6.(iii)(I) of this rule, the owner or operator of a landfill shall notify the Director by email or telephone no later than 48 hours before any known delay in the original test date, and arrange an updated date with the Director by mutual agreement.

(n) Each owner of operator that chooses to comply with the provisions in 40 CFR §§ 63.1958, 63.1960, and 63.1961, as allowed in paragraphs (2), (4), and (5) of this rule , the owner or operator shall submit the high temperature report according to §63.1981(k).

(7) Recordkeeping Requirements.

(a) Except as provided in subparagraph (6)(c)2. of this rule, each owner or operator of an MSW landfill subject to the provisions of subparagraph (1)(d) of this rule shall keep for at least 5 years up-to-date, readily accessible, on-site records of the design capacity report which triggered subparagraph (1)(d), the current amount of solid waste in-place, and the year-by-year waste acceptance rate. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.

(b) Except as provided in subparagraph (6)(c)2. of this rule, each owner or operator of a controlled landfill shall keep up-to-date, readily accessible records for the life of the control equipment of the data listed in subparagraphs (b)1. through (b)5. of this paragraph as measured during the

initial performance test or compliance determination. Records of subsequent tests or monitoring shall be maintained for a minimum of 5 years. Records of the control device vendor specifications shall be maintained until removal.

1. Where an owner or operator subject to the provisions of this Chapter seeks to demonstrate compliance with subparagraph (l)(a) of this Rule:

(i) The maximum expected gas generation flow rate as calculated in subparagraph (4)(a)1. of this rule. The owner or operator may use another method to determine the maximum gas generation flow rate, if the method has been approved by the Director.

(ii) The density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in subparagraph (8)(a)1. of this rule.

2. Where an owner or operator subject to the provisions of this Chapter seeks to demonstrate compliance with subparagraph (l)(b) of this rule through use of an enclosed combustion device other than a boiler or process heater with a design heat input capacity equal to or greater than 44 megawatts:

(i) The average combustion temperature measured at least every 15 minutes and averaged over the same time period of the performance test.

(ii) The percent reduction of NMOC determined as specified in subparagraph (l)(b)2. of this paragraph achieved by the control device.

3. Where an owner or operator subject to the provisions of this Chapter seeks to demonstrate compliance with subparagraph (l)(b)2.(i) of this rule through use of a boiler or process heater of any size: a description of the location at which the collected gas vent stream is introduced into the boiler or process heater over the same time period of the performance testing.

4. Where an owner or operator subject to the provisions of this Chapter seeks to demonstrate compliance with subparagraph (l)(b)1. of this rule through use of an open flare, the flare type (i.e., steam-assisted, air-assisted, or nonassisted), all visible emission readings, heat content determination, flow rate or bypass flow rate measurements, and exit velocity determinations made during the performance test as specified in §60.18, 40 CFR; continuous records of the flare pilot flame or flare flame monitoring and records of all periods of operations during which the pilot flame of the flare flame is absent.

5. Where an owner or operator subject to the provisions of this Chapter seeks to demonstrate compliance with subparagraph (l)(b)3. of this rule through use of a landfill gas treatment system:

(i) *Bypass records.* Records of the flow of landfill gas to, and bypass of, the treatment system.

(ii) *Site-specific treatment monitoring plan*, to include:

(I) Monitoring records of parameters that are identified in the treatment system monitoring plan and that ensure the treatment system is operating properly for each intended end use of the treated landfill gas. At a minimum, records should include records of filtration, de-watering, and compression parameters that ensure the treatment system is operating properly for each intended end use of the treated landfill gas.

(II) Monitoring methods, frequencies, and operating ranges for each monitored operating parameter based on manufacturer's recommendations or engineering analysis for each intended end use of the treated landfill gas.

(III) Documentation of the monitoring methods and ranges, along with justification for their use.

(IV) Identify who is responsible (by job title) for data collection.

(V) Processes and methods used to collect the necessary data.

(VI) Description of the procedures and methods that are used for quality assurance, maintenance, and repair of all continuous monitoring systems.

(c) Except as provided in subparagraph (6)(c)2. of this rule, each owner or operator of a controlled landfill subject to the provisions of this Chapter shall keep for 5 years up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored in paragraph (5) of this rule as well as up-to-date, readily accessible records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded.

1. The following constitute exceedances that shall be recorded and reported under subparagraph (6) of this rule:

(i) For enclosed combustors except for boilers and process heaters with design heat input capacity of 44 megawatts (150 million British thermal unit per hour) or greater, all 3-hour periods of operation during which the average combustion temperature was more than 28 °C (82 degrees Fahrenheit) below the average combustion temperature during the most recent performance test at which compliance with subparagraph (l)(b) of this rule was determined.

(ii) For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone as required under subparagraph (b)3. of this paragraph.

2. Each owner or operator subject to the provisions of this Chapter shall keep up-to-date, readily accessible continuous records of the indication of flow to the control device or the indication of bypass flow or records of monthly inspections of car-seals or lock-and-key configurations used to seal bypass lines, specified under paragraph (5) of this rule.

3. Each owner or operator subject to the provisions of this Chapter who uses a boiler or process heater with a design heat input capacity of

44 megawatts or greater to comply with subparagraph (l)(b) shall keep an up-to-date, readily accessible record of all periods of operation of the boiler or process heater. (Examples of such records could include records of steam use, fuel use, or monitoring data collected pursuant to other State regulatory requirements.)

4. Each owner or operator seeking to comply with the provisions of this Chapter by use of an open flare shall keep up-to-date, readily accessible continuous records of the flame or flare pilot flame monitoring specified under subparagraph (5)(c) of this rule, and up-to-date, readily accessible records of all periods of operation in which the flame or flare pilot flame is absent.

5. Each owner or operator of a landfill seeking to comply with subparagraph (l)(d) of this rule using an active collection system designed in accordance with subparagraph (l)(d) of this rule shall keep records of periods when the collection system or control device is not operating.

(d) Except as provided in subparagraph (6)(c)2. of this rule, each owner or operator subject to the provisions of this Chapter shall keep for the life of the collection system an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label for each collector that matches the labeling on the plot map.

1. Each owner or operator subject to the provisions of this Chapter shall keep up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under subparagraph (4)(b) of this rule.

2. Each owner or operator subject to the provisions of this Chapter shall keep readily accessible documentation of the nature, date of deposition, amount, and location of asbestos-containing or nondegradable waste excluded from collection as provided in subparagraph (8)(a)3.(i) of this rule as well as any nonproductive areas excluded from collection as provided in subparagraph (8)(a)3.(ii) of this rule.

(e) Except as provided in subparagraph (6)(d)2. of this rule, each owner or operator subject to the provisions of this Chapter shall keep for at least 5 years up-to-date, readily accessible records of the items in subparagraphs (e)(1) through (5) of this paragraph. Each owner or operator that chooses to comply with the provisions in 40 CFR §§ 63.1958, 63.1960, and 63.1961, as allowed in paragraphs (2), (4), and (5) of this rule, shall keep the records in subparagraph (e)(6) of this paragraph and must keep records according to 40 CFR § 63.1983(e)(1) through (5) in lieu of subparagraphs (e)(1) through (5) of this paragraph.

1. All collection and control system exceedances of the operational standards in paragraph (2) of this rule, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance.

2. Each owner or operator subject to the provisions of this Chapter shall also keep records of each wellhead temperature monitoring value of 55 degrees Celsius (131 degrees Fahrenheit) or above, each wellhead nitrogen level at or above 20 percent, and each wellhead oxygen level at or above 5 percent.

3. For any root cause analysis for which corrective actions are required in subparagraph (4)(a)3. or 5. of this rule, keep a record of the root cause analysis conducted, including a description of the recommended corrective action(s) taken, and the date(s) the corrective action(s) were completed.

4. For any root cause analysis for which corrective actions are required in subparagraph (4)(a)3.(ii) or (a)5.(ii) of this rule, keep a record of the root cause analysis conducted, the corrective action analysis, the date for corrective action(s) already completed following the positive pressure reading or high temperature reading, and, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates.

5. For any root cause analysis for which corrective actions are required in subparagraph (4)(a)3.(iii) or (a)5.(iii) of this rule, keep a record of the root cause analysis conducted, the corrective action analysis, the date for corrective action(s) already completed following the positive pressure reading or high temperature reading, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates, and a copy of any comments or final approval on the corrective action analysis or schedule from the regulatory agency.

6. Each owner or operator that chooses to comply with the provisions in 40 CFR §§ 63.1958, 63.1960, and 63.1961, shall keep records of the date upon which the owner or operator started complying with the provisions in §§ 63.1958, 63.1960, and 63.1961.

(f) Landfill owners or operators who convert design capacity from volume to mass or mass to volume to demonstrate that landfill design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, as provided in the definition of "design capacity", shall keep readily accessible, on-site records of the annual recalculation of site-specific density, design capacity, and the supporting documentation. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic format are acceptable.

(g) Landfill owners or operators seeking to demonstrate that site-specific surface methane emissions are below 500 parts per million by conducting surface emission monitoring under the Tier 4 procedures specified in subparagraph (3)(a)6. of this rule shall keep for at least 5 years up-to-date, readily accessible records of all surface emissions monitoring and information related to monitoring instrument calibrations conducted according to sections 8 and 10 of Method 21 of appendix A of 40 CFR Part 60, including all of the following items:

1. Calibration records:

(i) Date of calibration and initials of operator performing the calibration.

(ii) Calibration gas cylinder identification, certification date, and certified concentration.

(iii) Instrument scale(s) used.

(iv) A description of any corrective action taken if the meter readout could not be adjusted to correspond to the calibration gas value.

(v) If an owner or operator makes their own calibration gas, a description of the procedure used.

2. Digital photographs of the instrument setup. The photographs shall be time and date-stamped and taken at the first sampling location prior to sampling and at the last sampling location after sampling at the end of each sampling day, for the duration of the Tier 4 monitoring demonstration.

3. Timestamp of each surface scan reading:

(i) Timestamp should be detailed to the nearest second, based on when the sample collection begins.

(ii) A log for the length of time each sample was taken using a stopwatch (*e.g.*, the time the probe was held over the area).

4. Location of each surface scan reading. The owner or operator shall determine the coordinates using an instrument with an accuracy of at least 4 meters. Coordinates shall be in decimal degrees with at least five decimal places.

5. Monitored methane concentration (parts per million) of each reading.

6. Background methane concentration (parts per million) after each instrument calibration test.

7. Adjusted methane concentration using most recent calibration (parts per million).

8. For readings taken at each surface penetration, the unique identification location label matching the label specified in subparagraph (d) of this paragraph.

9. Records of the operating hours of the gas collection system for each destruction device.

(h) Except as provided in subparagraph (6)(c)2. of this rule, each owner or operator subject to the provisions of this Chapter shall keep for at least 5 years up-to-date, readily accessible records of all collection and control system monitoring data for parameters measured in subparagraphs (5)(a)1., 2., and 3. of this rule.

(i) Any records required to be maintained by this Chapter that are submitted electronically via the EPA's CDX may be maintained in electronic format.

(j) For each owner or operator reporting leachate or other liquids addition under subparagraph (6)(k) of this rule, keep records of any engineering calculations or company records used to estimate the quantities of leachate or liquids added, the surface areas for which the leachate or liquids were applied, and the estimates of annual waste acceptance or total waste in place in the areas where leachate or liquids were applied.

(8) Specifications for Active Collection Systems.

(a) Each owner or operator seeking to comply with subparagraph (1)(a) of this rule shall site active collection wells, horizontal collectors, surface collectors, or other extraction devices at a sufficient density throughout all gas producing areas using the following procedures unless alternative procedures have been approved by the Director.

1. The collection devices within the interior and along the perimeter areas shall be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues shall be addressed in the design: depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, resistance to the refuse decomposition heat, and ability to isolate individual components or sections for repair or troubleshooting without shutting down entire collection system.

2. The sufficient density of gas collection devices determined in subparagraph (a)1. of this paragraph shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior.

3. The placement of gas collection devices determined in subparagraph (a)1. of this paragraph shall control all gas producing areas, except as provided by subparagraphs (a)3.(i) and (a)3.(ii) of this paragraph.

(i) Any segregated area of asbestos or nondegradable material may be excluded from collection if documented as provided under subparagraph (7)(d) of this rule. The documentation shall provide the nature, date of deposition, location and amount of asbestos or nondegradable material deposited in the area, and shall be provided to the Director upon request.

(ii) Any nonproductive area of the landfill may be excluded from control, provided that the total of all excluded areas can be shown to contribute less than 1 percent of the total amount of NMOC emissions from the landfill. The

amount, location, and age of the material shall be documented and provided to the Director upon request. A separate NMOC emissions estimate shall be made for each section proposed for exclusion, and the sum of all such sections shall be compared to the NMOC emissions estimate for the entire landfill.

(I) The NMOC emissions from each section proposed for exclusion shall be computed using the following equation:

$$Q_i = 2kL_oM_i\left(e^{-kt_i}\right)\left(C_{NMOC}\right)\left(3.6\times10^{-9}\right)$$

where,

Q_i = NMOC emission rate from the i^{th} section, megagrams per year

k = methane generation rate constant, $year^{-1}$

L_o = methane generation potential, cubic meters per megagram solid waste

M_i = mass of the degradable solid waste in the i^{th} section, megagram

t_i = age of the solid waste in the i^{th} section, years

C_{NMOC} = concentration of nonmethane organic compounds, parts per million by volume

3.6×10^{-9} = conversion factor

(II) If the owner or operator is proposing to exclude, or cease gas collection and control from, nonproductive physically separated (*e.g.*, separately lined) closed areas that already have gas collection systems, NMOC emissions from each physically separated closed area shall be computed using either equation in subparagraph (3)(b) of this rule, or the equation in subparagraph (a)3.(ii)(I) of this paragraph.

(iii) The values for k, and C_{NMOC} determined in field testing shall be used, if field testing has been performed in determining the NMOC emission rate or the radii of influence (the distance from the well center to a point in the landfill where the pressure gradient applied by the blower or compressor approaches zero). If field testing has not been performed, the default values for k, L_o and C_{NMOC} provided in paragraph (3) of this rule or the alternative values from paragraph (3) of this rule shall be used. The mass of nondegradable solid waste contained within the given section may be subtracted from the total mass of the section when estimating emissions provided the nature, location, age, and amount of the nondegradable material is documented as provided in subparagraph (a)3.(i) of this paragraph.

(b) Each owner or operator seeking to comply with subparagraph (l)(a) of this rule shall construct the gas collection devices using the following equipment or procedures:

1. The landfill gas extraction components shall be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of suitable dimensions to: convey projected amounts of gases; withstand installation, static, and settlement forces; and withstand planned overburden or traffic loads. The collection system shall extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors shall be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations shall be situated with regard to the need to prevent excessive air infiltration.

2. Vertical wells shall be placed so as not to endanger underlying liners and shall address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors shall be of sufficient cross-section so as to allow for their proper construction and completion including, for example, centering of pipes and placement of gravel backfill. Collection devices shall be designed so as not to allow indirect short circuiting of air into the cover or refuse into the collection system or gas into the air. Any gravel used around pipe perforations should be of a dimension so as not to penetrate or block perforations.

3. Collection devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly shall include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous material of suitable thickness.

(c) Each owner or operator seeking to comply with subparagraph (l)(b) of this rule shall convey the landfill gas to a control system in compliance with subparagraph (l)(b) of this rule through the collection header pipe(s). The gas mover equipment shall be sized to handle the maximum gas generation flow rate expected over the intended use period of the gas moving equipment using the following procedures:

1. For existing collection systems, the flow data shall be used to project the maximum flow rate. If no flow data exists, the procedures in subparagraph (c)2. of this paragraph shall be used.

2. For new collection systems, the maximum flow rate shall be in accordance with subparagraph (4)(a)1. of this rule.

Author: Ronald W. Gore
Statutory Authority: Code of Alabama 1975, §§22-28-14, 22-22A-5, 22-22A-6, 22-22A-8.
History: Effective Date: Proposed: July 20, 2021.

335-3-19-.04 ~~Reserved~~ Compliance Schedules.

(1) Planning, awarding of contracts, installing, and starting up MSW landfill air emission collection and control equipment that is capable of meeting the emission standards under this Chapter shall be completed within 30 months after the date an NMOC emission rate report shows NMOC emissions equal or exceed 34 megagrams per year (50 megagrams per year for the closed landfill subcategory); or (2) Within 30 months after the date of the most recent NMOC emission rate report that shows NMOC emissions equal or exceed 34 megagrams per year (50 megagrams per year for the closed landfill subcategory), if Tier 4 surface emissions monitoring shows a surface emission concentration of 500 parts per million methane or greater.

Author: Ronald W. Gore
Statutory Authority: Code of Alabama 1975, §§22-28-14, 22-22A-5, 22-22A-6, 22-22A-8.
History: Effective Date: Proposed: July 20, 2021.

335-3-19-.05 ~~Reserved~~ Petition for Alternative Standards and Compliance Schedules.

(1) A MSW landfill owner or operator may request through petition, alternative emission standards or a longer compliance schedule that is/are not specified in this Chapter through the following procedures.

(a) Petition Requirements. To enable the Department to rule on the Petition, the following information, where determined applicable by the Department, shall be included in the petition:

1. A clear and complete statement of the precise extent of the relief sought including specific identification of the particular provisions of the regulations from which the relief is sought. The criteria for relief include:

(i) Unreasonable cost of control resulting from landfill age, location, or basic design:

(ii) Physical impossibility of installing necessary control equipment; or

(iii) Other factors specific to the landfill that make application of a less stringent standard or final compliance time significantly more reasonable.

(2) An assessment, with supporting factual information, of the impact that the petition will impose on the public health and the environment in the affected area.

(3) Any additional information requested by the Department as necessary to evaluate the petition.

(4) A concise factual statement of the reasons the petitioner believes that alternative emission limits or a longer compliance schedule will not threaten the public health or unreasonably create environmental pollution.

(b) Extension of Prior or Existing Alternative Emission Standards or Compliance Schedule. A petition to extend a prior or existing petition granted by the Department shall be commenced by filing a new petition with the Department in accordance with the requirements of paragraph (1) of this rule. To the extent that the information required by paragraph (1) of this rule has been included in the prior petition for which extension is sought, a submission of that information shall not be required provided that the petition shall request the incorporation of the record, opinion and order in the prior proceeding into the new petition.

(c) Department Actions on Petitions. On receipt of a petition, the Department will authorize one of the following actions, as they shall determine:

1. The petition may be dismissed if the Department determines that it is not adequate under paragraph (1) of this rule.

2. The Department may grant the request of the petition, as petitioned or by imposing such conditions as this Division may require in the Major Source Operating Permit, including the establishment of schedules of compliance and monitoring requirements, if EPA consents to the alternative emission standards or compliance schedule as submitted to EPA by the Department.

3. The Department may deny the petition. If such a denial is made, the Department shall notify the petitioner in writing, state the reasons for denial and outline procedures for appeal.

(d) Termination Procedures. Any petition granted by the Department may be terminated by the Department whenever the Department finds, after an opportunity for the petitioner to demonstrate compliance and after notice and an opportunity for hearing, that the petitioner is in violation of any requirement, condition, schedule, limitation or any other provision of the petition or that operation under the petition does not meet the minimum requirements established by state and federal laws and regulations or is unreasonably threatening the public health.

Author: Ronald W. Gore
Statutory Authority: Code of Alabama 1975, §§22-28-14, 22-22A-5, 22-22A-6, 22-22A-8.
History: Effective Date: Proposed: July 20, 2021.